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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte FABRICE MARINET and
ALEXANDRE MALHERBE

Appeal 2009-006126
Application 09/995,258
Technology Center 2400

Decided: August 26, 2009

Before ROBERT E. NAPPI, KARL D. EASTHOM, and
ELENI MANTIS MERCADER, *Administrative Patent Judges*.

MANTIS MERCADER, *Administrative Patent Judge.*

DECISION ON APPEAL

This is an appeal under 35 U.S.C. §§ 6(b) and 134(a) from the final rejection of claims 17-32 and 42-49.

We reverse.

STATEMENT OF THE CASE

The disclosed invention relates to a folded MOS transistor having an S- or zigzag-shaped channel 24, with several portions that are parallel to each other connected through bent portions (Spec. 9:6-8; amended Fig. 3a).

Claim 17 is representative of the claimed invention, and reads as follows:

> 17. A random signal generator comprising:
> an electronic noise source comprising a folded MOS transistor having a drain-source current with a random component;
> said folded MOS transistor comprising a drain and a source with a folded channel defined therebetween; and
> a circuit for generating a digital signal based upon the random component.

The Examiner relies upon the following as evidence of unpatentability:

Morozumi	US 4,862,237	Aug. 29, 1989 (Effectively Filed Jan. 10, 1984)

The following rejections are before us for review.

The Examiner rejected claims 17-32 and 42-49 under 35 U.S.C. § 102(b) as being anticipated by Morozumi.

Claim 17 recites the limitations of "a folded MOS transistor having a drain-source current with *a random component*" and "a circuit for generating *a digital signal based upon the random component*" (emphasis added).

The Examiner states that based on Appellants' Specification the random component is determined by the bending or folding of the channel (Ans. 7-8). The Examiner finds that Morozumi's disclosed S-shaped channel region (col. 10, ll. 13-15) meets the limitation of a "random component" to produce a random signal (Ans. 8). In other words, the Examiner reasons that the S-shaped channel region would produce a "random component." Furthermore, the Examiner contends that the "random component" is not further limiting as it is merely an indication of intended use (Ans. 8). The Examiner does not respond to Appellants' argument (App. Br. 9) that the circuit does not generate a digital signal based upon the random component, but rather, reiterates that a "random component" is generated (Ans. 8).

Appellants argue that Morozumi does not disclose any source for generating a random signal because the imaging sensor of Morozumi depends on predictable currents being generated in the channel of the sensing cell to have accurate signals related to the image being sensed (App. Br. 9; referring to Morozumi's col. 2, ll. 63-68). Appellants also contend that a skilled artisan would not appreciate the needed modifications to Morozumi to produce the claimed invention, because inherency can be proved when the missing descriptive element is necessarily present and

cannot be established by the mere fact that a certain thing may result from a given set of circumstances (App. Br. 10). *See In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999). Appellants explain that one skilled in the art would not appreciate the needed modifications to Morozumi to produce the claimed invention because Morozumi is directed to an entirely different field, i.e. predictable and regular current generation for an imaging sensor (App. Br. 9-10).

Appellants argue that the "random component" is not intended use, but rather, "*a distinct structure of the folded MOS transistor that produces a random component in the drain-source current"* (emphasis added) (App. Br. 10).

Appellants further assert that Morozumi (col. 3, ll. 18-22) discloses that "the charge generated in the photo-sensitive member is directly proportional to the incident light," and thus, Morozumi does not teach a circuit for generating a digital signal based upon the random component (App. Br. 9).

The pivotal issue before us is whether the Examiner has provided a sound basis for believing that because Morozumi discloses an S-shaped channel the structure inherently creates a random component which can be used to generate a digital signal based upon that random component.

Appellants' Specification discloses that "[t]he drain-source current includes a random component *when the channel dimensions are chosen to be close to the minimum resolution allowed* by the manufacturing technology in use" (emphasis added) (Spec. 9:18-21). Appellants' Specification specifically describes the channel dimensions with a 0.35 μm integration technology to require that "*the width of parallel and folded portions of the*

gate is less than 1 μm . . . whereas the distance between parallel portions is on the order of 1.5 μm" for the drain source current to include a random component (emphasis added) (Spec. 9:24-34).[1]

Our reviewing Court found that "[w]hen the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not." *In re Spada*, 911 F.2d 705, 709 (Fed. Cir. 1990). We are not convinced that the Examiner has met the burden of establishing that the products are the same so that the random component is necessarily produced. The Examiner solely relies on the S-shaped channel for the inherency of the random component (Ans. 7). However, Appellants' Specification describes the creation of a random component as the result of "*the width of parallel and folded portions of the gate*" being less than 1 μm and "*the distance between parallel portions*" being on the order of 1.5 μm (emphasis added) (Spec. 9:24-34). The Examiner did not address where these dimensions are taught in Morozumi, nor can we find any section of Morozumi that addresses the width of the parallel and folded portions and the distance between the parallel portions so as for the S-shaped channel to necessarily produce a random component.

The section in Morozumi addressing the formation of the channel addresses the thicknesses of the layers used in the process (col. 10, l. 47-col. 11, l. 4), however there is no reference as to the thickness neither of the channel portions nor of the distances between the parallel portions. Thus, we are not convinced that the S-shaped channel of Morozumi necessarily

[1] We note that Appellants have amended the Specification on October 10th, 2007 to include the numerals 25 and 26 but inadvertently changed the notations of μm to mm. Appellants need to correct the notations of mm to μm to avoid the implication of new matter.

produces a random component as required by the principle of inherency under 35 U.S.C. § 102. *See In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999). Accordingly, we are persuaded by Appellants argument that the "random component" is not intended use, but rather, "*a distinct structure of the folded MOS transistor that produces a random component in the drain-source current"* (emphasis added) (App. Br. 10). More particularly we are persuaded that there is a distinct structure defined by the dimensions of the channel and in particular the width of parallel and folded portions and the distance between the parallel portions.

Furthermore, Appellants' Specification further discloses that the random component ΔI of the drain-source current *increases* as the number of bends in a folded MOS transistor increases (Spec. 9:35-37; Spec. 9:6-8; amended Fig. 3a). However, Appellants' Specification cautions against increasing the number of bends by too much, which would in turn cause the drain-source current to decrease and thus require it to be amplified with a large gain (Spec. 9:36-10:2). Consequently, Appellants disclose an optimum number of 10 folds (Spec. 10:5-6).

Accordingly, Appellants disclose 10 folded channel bends in order to create the desired "random component," and thus, we are not persuaded that Morozumi's S-shaped channel region, which only at best has two folds, *necessarily* produces the "random component" so as to generate "a digital signal based upon the random component" as recited in claim 7. This is especially important in considering the vast difference in purpose between the two inventions.

Appellants' invention takes advantage of folded MOS transistors such as those having a zigzag shaped channel which are unusable because the

drain-source current has an increasingly strong random component when the "*size of the zigzag shaped channel decreases*" (Spec. 2:29-37) (i.e., dimensions of the channel as addressed *supra*). Appellants' invention takes advantage of this drawback to provide a random signal generator integrated in a circuit for generating a random binary digital signal from the random component to be utilized for smart cards (Spec. 2:37-3:10). Furthermore, Appellants' Specification discloses that the random component ΔI of the drain-source current *increases* as the number of bends in a folded MOS transistor increases (Spec. 9:35-37; Spec. 9:6-8; amended Fig. 3a). Appellants disclose an optimum number of 10 folds (Spec. 10:5-6).

On the other hand, Morozumi is concerned with eliminating undesired noise in order to increase the signal to noise ratio (col. 12, ll. 10-13; col. 12, ll. 27-32) and thereby produce visual images of high resolution (col. 11, ll. 56-58). Even if one were to assume that there was a "random component" created by the S-shaped channel of Morozumi, two folds of the channel *may* not be sufficient to create enough of a random component to produce a digital signal based on that component. *See In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999).

Moreover, why would one introduce a random component and then try to eliminate it by increasing the signal to noise ratio or filtering the noise? Also, while Morozumi is concerned with increasing the resolution (col. 12, ll. 56-58), Appellants choose the dimensions so as to be as close to the minimum resolution allowed by the manufacturing technology or even slightly less than the minimum (Spec. 9:18-24).

Finally, even if the twofold channel was sufficient to create a random component, the signal to noise processing performed in Morozumi would

either eliminate or reduce that random component, and thus, the digital signal would not be based on "the random component."

Thus, the Examiner has not provided a sound basis for believing that because Morozumi discloses an S-shaped channel the structure inherently creates a random component which can be used to generate a digital signal based upon that random component.

Accordingly, for all the reasons stated *supra*, we reverse the Examiner's rejection of claim 17, and claims 18-32 and 42-49 for similar reasons.

CONCLUSION

The Examiner erred in rejecting claims 17-32 and 42-49 under 35 U.S.C. §102.

DECISION

The Examiner's decision rejecting claims 17-32 and 42-49 is reversed.

REVERSED

ELD

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